

Serial No. 09/686,624

Attorney Docket No. 253/006

AMENDMENTS TO THE CLAIMSListing of the Claims:

Claims 1-9. (Previously Canceled)

Claims 10-12. (Canceled)

Claim 13. (Previously Canceled)

Claims 14-22. (Canceled)

23. (Currently Amended) A method of forming a silicon oxide layer comprising:

- providing a semiconductor substrate having a stepped portion,
- coating the semiconductor substrate with a spin-on glass (SOG) composition containing perhydropolysilazane having the compound formula  $-(\text{SiH}_2\text{NH})_n$  wherein  $-(\text{SiH}_2\text{NH})_n$  wherein n represents a positive integer, a weight average molecular weight within the range of from about 4,000 to about 8,000, a molecular weight dispersion within the range of about 3.0 to about 4.0<sub>2</sub>; and
- curing the SOG layer to form a layer of silicon oxide having a planar surface,

wherein the stepped portion is formed by:

- partially etching an upper portion of the semiconductor substrate to form a trench; and
- the silicon oxide layer is formed by:
  - coating the SOG composition on the substrate to fill the trench and to form an SOG layer; and
  - curing the SOG layer by:

Serial No. 09/686,624

Attorney Docket No. 253/006

pre-baking the SOG layer at a temperature within the range of from about 100 to about 500 °C for a first period of time; and  
main-baking the SOG layer at a temperature within the range of about 900 to about 1000 °C for a second period of time.

24. (Original) The method as claimed in claim 23, wherein the weight average molecular weight of the perhydropolysilazane of the SOG composition is about 6000-8000.

25. (Previously Twice Amended) A method of forming a silicon oxide layer comprising:  
providing a semiconductor substrate having a stepped portion;  
coating the semiconductor substrate with a spin-on glass (SOG) composition containing perhydropolysilazane having the compound formula  $-(\text{SiH}_2\text{NH})_n-$  wherein n represents a positive integer, a weight average molecular weight within the range of from about 4,000 to about 8,000, a molecular weight dispersion within the range of about 3.0 to about 4.0; and

curing the SOG layer to form a layer of silicon oxide having a planar surface,  
wherein the stepped portion is formed by:

forming a plurality of gate electrodes on the semiconductor substrate;  
and the silicon oxide layer is formed by:

coating the SOG composition on the substrate to completely cover the plurality of gate electrodes and to form an SOG layer; and  
curing the SOG layer by:

Serial No. 09/686,624

Attorney Docket No. 253/006

pre-baking the SOG layer at a temperature within the range of from about 100 to about 500°C for a first period of time; and  
main-baking the SOG layer at a temperature within the range of about 600 to about 900 °C for a second period of time.

26. (Original) The method as claimed in claim 25, wherein the weight average molecular weight of the perhydropolysilazane of the SOG composition is about 4000-6000.

27. (Previously Twice Amended) A method of forming a silicon oxide layer comprising:

- providing a semiconductor substrate having a stepped portion;
- coating the semiconductor substrate with a spin-on glass (SOG) composition containing perhydropolysilazane having the compound formula  $-(\text{SiH}_2\text{NH})_n-$  wherein  $n$  represents a positive integer, a weight average molecular weight within the range of from about 4,000 to about 8,000, a molecular weight dispersion within the range of about 3.0 to about 4.0; and
- curing the SOG layer to form a layer of silicon oxide having a planar surface, wherein the stepped portion is formed by:
  - forming an insulation layer on the semiconductor substrate; and
  - forming a plurality of metal wiring patterns on the insulation layer;
- and the silicon oxide layer is formed by:
  - coating the SOG composition on the substrate to completely cover the metal wiring patterns thereby to form an SOG layer; and

Serial No. 09/686,624Attorney Docket No. 253/006

curing the SOG layer by:

pre-baking the SOG layer at a temperature within the range of from  
about 100 to about 500 °C for a first period of time; and  
main-baking the SOG layer at a temperature within the range of  
about 400 to about 450 °C for a second period of time.

28. (Original) The method as claimed in claim 27, wherein the weight average  
molecular weight of the perhydropolysilazane of the SOG composition is about 4500-  
7500.

Claims 29-37 (Previously Canceled)